## WHAT IS CLAIMED IS:

l	1. A sensor apparatus, comprising:	
2	two or more sensor devices;	
3	a processing module coupled to each of the sensor devices and configured to	
4	process signals received from each of the two or more sensor devices to determine an	
5	environmental state; and	
6	a communication module that communicates information about the	
7	environmental state to a user.	
1	2. The apparatus of claim 1, wherein the processor is configured to	
2	execute a first process that detects a change in an environmental condition, and a second	
3	process that identifies the origin of the change in the environmental condition.	
1	3. The apparatus of claim 2, wherein the second process includes a	
2	pattern recognition algorithm.	
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1 2	4. The apparatus of claim 1, wherein the power required to operate the	
2	apparatus is less than about 1 milliwatt.	
1	5. The apparatus of claim 4, further including one of a battery and a sola	
2	cell for supplying the power.	
1	6. The apparatus of claim 4, further including a pick-up antenna, wherein	
2	11 y	
۷	the power is supplied by an external RF field received by the antenna.	
1	7. The apparatus of claim 1, wherein the communication module include	
2	one of a LED, speaker, buzzer and vibration mechanism.	
1	8. The apparatus of claim 1, wherein the communication module include	
2	8. The apparatus of claim 1, wherein the communication module include one of a wireless interface device and a physical bus interface.	
2	one of a wheress interface device and a physical bus interface.	
1	9. The apparatus of claim 8, wherein the wireless interface device	
2	includes one of an RF transmitter, an RF transceiver, an IR transmitter and an IR transceiver.	
1	10. The apparatus of claim 8, wherein the physical bus interface includes	
2	one of an RS-232 port, a USB port and a Firewire port.	
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1	11.	The apparatus of claim 1, wherein at least two of the sensor devices are
2	polymer composite	sensors.
1	12.	The apparatus of claim 1, wherein at least one of the sensor devices is
2	a chemical sensor.	The apparatus of elaim 1, wherein at least one of the sensor devices is
1	13.	The apparatus of claim 12, wherein the chemical sensor is selected
2	from the group cons	sisting of a polymer composite sensor and a surface modified carbon black
3	sensor.	
1	14.	The apparatus of claim 1, wherein the apparatus has a dimension of
2	less than about 4 sq	
_	roso than about 1 sq	date mones.
1	15.	The apparatus of claim 1, wherein the apparatus has a dimension of
2	less than about 1 sq	uare inch.
1	16.	The emperature of claims 1 and emit the common of the
2		The apparatus of claim 1, wherein the sensors and the processing ed on a single silicon chip.
4	module are integrate	ed on a single sincon chip.
1	17.	The apparatus of claim 1, further including an attachment mechanism
2	for allowing a user t	o wear the apparatus.
1	18.	The emperature of claims 17 and anning the extended to the control of the control
2	includes one of a cli	The apparatus of claim 17, wherein the attachment mechanism
<b>4</b>	mendes one of a cir	p and a pm.
1	19.	The apparatus of claim 1, wherein the processing module is configured
2	to automatically con	nmunicate information about the environmental state to an external
3	intelligence module	using the communication module.
1	20	
2	20.	The apparatus of claim 1, wherein the apparatus is used to diagnose a
2	disease based on san	apling the environment of a bodily fluid.
1	21.	A wearable sensor device comprising:
2	a com	apact housing structure;
3	an att	achment mechanism coupled to the housing structure;
1	one o	r more polymer-composite sensors;
5	an ala	rm module; and

6	a digital signal processor configured to monitor signals from the one or more		
7	sensors and provide an alarm activation signal to the alarm module in response to the		
8	detection of a threshold condition.		
1	22. The device of claim 21, further comprising a communication module		
2	configured to communicate with an external processor.		
1	23. The device of claim 22, wherein the communication module includes a		
2	wireless transmitter device.		
_	wholoss transmitted device.		
1	24. The device of claim 23, wherein the wireless transmitter device		
2	includes one of an RF transmitter and an IR transmitter.		
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1	25. The device of claim 21, wherein the attachment mechanism includes		
2	one of a clip and a pin for attaching the device to a user.		
1	26. An integrated sensor apparatus, comprising:		
2	an array of two or more polymer composite sensors;		
3	a processing module coupled to each of the sensors and configured to process		
4	signals received from each of the two or more sensor devices to determine an environmental		
5	state; and		
5	a communication module that communicates information about the		
7	environmental state to a user.		
•	and the same state to a above		
i	27. The apparatus of claim 1, wherein the processor is configured to		
2	execute a first process that detects a change in an environmental condition, and a second		
3	process that identifies the origin of the change in the environmental condition.		
	28. The apparatus of claim 27, further comprising a memory module		
2	configured to store various parameters associated with one or more environmental conditions.		
Į	29. The apparatus of claim 28, wherein the memory module further stores		
2	algorithms used by the first and second processes.		
	C The second processes.		
	30. The apparatus of claim 26, further including a power source selected		
2	from the group consisting of a battery, a solar cell, an RF tag module and an IR tag module		

1	The apparatus of claim 27, wherein the communication module		
2	includes a wireless transceiver and wherein the processor is configured to automatically		
3	communicate information about environmental conditions with an external intelligence		
4	module using the communication module.		
1	32. The apparatus of claim 27, wherein the communication module		
2	includes a physical port interface and wherein the processor is configured to automatically		
3	communicate information about environmental conditions with an external intelligence		
4	module using the communication module when the physical port interface is connected to a		
5	bus interface.		
1	33. The apparatus of claim 32, wherein the bus interface is one of an RS-		
2	232 bus, a USB bus and a Firewire bus.		
1	34. The apparatus of claim 26, wherein the communication module		
2	includes one of an LED, a vibration module and a speaker.		
1	35. The apparatus of claim 26, wherein the apparatus is implemented in a		
2	user-wearable badge.		
1	36. A portable sensor apparatus, comprising:		
2	two or more sensor devices;		
3	a processing module coupled to each of the sensor devices and configured to		
4	process signals received from each of the two or more sensor devices to determine an		
5	environmental state;		
6	a communication module that communicates information about the		
7	environmental state to a user; and		
8	a power supply module configured to supply power for the sensor apparatus,		
9	wherein the lifetime of the power supply during continuous operation of the apparatus		
10	exceeds two weeks.		
1	37. The apparatus of claim 36, wherein the lifetime of the power supply		
2	during continuous operation of the apparatus exceeds two months.		
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1	38. The apparatus of claim 36, wherein the lifetime of the power supply		
2	during continuous operation of the apparatus exceeds two years.		

1	39. The apparatus of claim 36, further comprising a power management	
2	module configured to control power flow from the power supply module to the processor	
3	module.	
1	40. The apparatus of claim 36, wherein the apparatus operates in a passive	
2	and continuous manner without user intervention.	
1	41. A method of using a wearable badge detector, the badge detector	
2	having two or more sensor devices, a processing module coupled to each of the sensor	
3	devices and configured to process signals received from each of the two or more sensor	
4	devices to determine an environmental state, a communication module that communicates	
5	information about the environmental state to a user, and a power supply module for supplying	
6	power for the detector, the method comprising:	
7	providing the wearable badge detector to a user;	
8	attaching the detector to the user; and	
9	activating the detector, wherein once activated, the detector operates passively	
10	and continuously in excess of one week without requiring recharging or replacement of the	
11	power supply module.	
1	42. The method of claim 41, wherein the two or more sensors include	
2	polymer composite sensors.	
1	43. The method of claim 41, wherein activating includes attaching the	
2	power supply module to the detector.	
1	44. A portable sensor apparatus, comprising:	
2	two or more sensor devices;	
3	a processing module coupled to each of the sensor devices and configured to	
4	process signals received from each of the two or more sensor devices to determine an	
5	environmental state; and	
6	a communication module that communicates information about the	
7	environmental state to a user;	
8	wherein the apparatus operates in a passive and continuous manner without	
9	user intervention.	

- 1 45. The apparatus of claim 44, wherein the processor is configured to 2 execute a first process that detects a change in an environmental condition, and a second 3 process that identifies the origin of the change in the environmental condition.
- 1 46. The apparatus of claim 45, wherein the second process includes a pattern recognition algorithm.
- The apparatus of claim 44, further comprising a power supply module configured to supply power for the sensor apparatus, wherein the lifetime of the power supply during continuous operation of the apparatus exceeds two weeks.
- 1 48. The apparatus of claim 44, further including an attachment mechanism 2 for allowing a user to ear the apparatus.
- 1 49. The apparatus of claim 44, wherein the two or more sensors include 2 two or more polymer composite sensors.